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AUTHOR McIntyre, Susan R.; Tlusty, Roger H.
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ABSTRACT

A promising strategy for encouraging reflection among student teachers is the use of dialog journals--logs or records of thoughts responded to by other writers. Electronic mail (e-mail) could be used as a medium for developing an electronic dialog journal that overcomes many of the practical constraints of the usual journal. The use of e-mail as a dialog journal medium was studied with 11 student teachers at 2 different teaching placements. In addition to the e-mail journals, additional data came from the student teachers' supervisors and a survey of participants. Students were directed to use the e-mail to send a synthesis of written self-critiques as they reflected on their teaching practices. Students sent a total of 294 e-mail messages during the 16-week semester, and only 3 students sent fewer than the minimum requirement of 1 message each week, Students responded favorably to the technology, but there is no direct evidence that the e-mail provided an effective measure of reflection. However, using electronic mail did provide a vehicle for student-teacher discourse that could promote reflection. (Contains 15 references.) (SLD)

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Computer-Mediated Discourse:
Electronic Dialogue Journaling and Reflective Practice

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Susan R. McIntyre (mcintsr@uwec)
Roger H. Tlusty (tlustyrh@uwec)
University of Wisconsin - Eau Claire
Curriculum & Instruction Department
Brewer Hall 271
Eau Claire, WI 54701

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Refection in Teaching:

Reflectivity in teaching and learning to teach has been explored by a number of scholars (Cruickshank, 1987; Schon, 1987; Zeichner & Liston, 1987). That work is providing a growing body of evidence to affirm the importance of reflection in teachers' professional development. Variation in social and cultural contexts, the complexities of classroom dynamics, and the dilemmas of curricular and instructional challenges requires that teachers be prepared to analyze situations, solve problems, and make decisions in a thoughtful and reflective manner. There are however, serious impediments to the development of this reflectivity.

Several researchers, for example, have reported on the lack of opportunities for engaging in reflective processes during the teacher education sequence, especially during student teaching (Feiman-Nemser & Buchmann, 1985; Feiman-Nemser & Floden, 1986; Wildman, Magliaro, Niles & McLaughlin, 1990). Many teacher education programs have lacked both the curricular organization and the instructional technology for encouraging preservice teachers to be reflective. While some advances have been made in establishing the importance of discourse in the development of reflectivity produced through writing, speaking and listening, efforts to use these strategies are handicapped by the lack of collegiality between peer student teachers (Su, 1990) and in the hierarchical relationships that exist between supervisors and subordinates.

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University practices which separate student teachers through placements in distant and unconnected schools further inhibits opportunities to engage in the kind of discourse that will engender reflectivity. Thus even those programs that recognize the need for reflection, and see the importance of discourse in the development of the reflective process (Copeland, 1986; Schmidt & Davidson 1983; Wildman, et. al., 1990; Zeichner & Liston 1987) must establish communication linkages that create opportunities for discourse.

One promising strategy is the use of dialogue journals. "Dialogue is the sealing together of the teacher and the students in the joint act of knowing and re-knowing the object of study. Then, instead of transferring the knowledge statically, as fixed possession of the teacher, dialogue demands a dynamic approximation toward the object" (Shor & Freire, 1987, 14). A dialogue journal is a log or record of thoughts kept by a writer and responded to by other writers (Stanton, Shuy, Peyton, & Reed, 1988). That writing, reading and response cycle creates a dynamic discourse that produces shared, mutually constructed knowledge. As a consequence, the process of constructing that knowledge engages the individual in the kind of problem setting, analysis and generalization that is characteristic of reflective thinking. But traditional dialogue journals may, in fact, restrict student teacher growth because students are often required to submit a completely formulated position before receiving feedback. The process of setting and defining the problem is not part of the discourse. Additionally, lag time between the writer's formulation of ideas and the reader's response creates a lack of social interaction where members of the interpretive community (readers and writers) can construct the conventions of the language and their meaning (Vygotsky, 1978). Furthermore, because journal conversations often occur between supervisors and subordinates (student teachers), hierarchical relationships may inhibit students from revealing their opinions, positions, and

thoughts. Thus, one of the most promising tools for fostering reflectivity is undermined by logistical and social realities. The medium of electronic mail doesn't guarantee an egalitarian and safe dialogue, but it makes it possible. One challenge for teacher educators is finding ways of overcoming social impediments.

Electronic mail is one of the potential resources for making advances in educational strategies for developing reflectivity. As a utility, it can provide linkages between student teachers, cooperating teachers and university faculty, and thereby create opportunities for discourse to promote reflective thinking about teaching. Electronic mail could be used as a medium for developing an "electronic dialogue journal" that contributes to a larger discourse in the construction of knowledge. An electronic dialogue journal potentially has a distinct advantage over traditional dialogue journals as it allows for contemporaneous, but not necessarily simultaneous, discourse. As a collateral benefit, it can provide prospective teachers with experience using innovative instructional technology and telecommunications to address practical educational problems. One of electronic mail's distinct advantages is that it can connect writers and readers located at some distance from one another, particularly students who are located at some distance from the university.

But the use of this resource is not without potential problems, not the least of which is the lack of technological comfort and proficiency of many teacher education students, professors and others (Beverstock & Chandler, 1992; Brooks and Kopp, 1990). Technology, and constant change in its use and potential, causes anxiety for users at all ages and levels of status. Indeed, in many cases students have far less discomfort with using technology than do university faculty. If electronic mail is to be an effective tool for facilitating the development of reflectivity through electronic dialoguing, it must be shown to be a viable and

preferable alternative to traditional dialogue journals. A good deal of that viability will be determined by the willingness and ability of students to use electronic mail, especially given a relatively limited level of technological sophistication and in the absence of extensive immediate assistance available.

The Study: Electronic Mail as Dialogue Journaling

Electronic mail was used in this study to create opportunities for student teachers working at diverse and distant sites to write about their experiences and thinking, to participate in reflective discourse about teaching practice, to become more collegial, and to advance their technological literacy and proficiency. The effectiveness of electronic mail as a means of communication for supervisors and student teachers and as a medium for promoting reflectivity in pre-service teachers was explored. Electronic journaling in this study required student teachers in various disciplines and at distant schools to use electronic mail to write journal entries, read journal entries from a supervisor and other student teachers, write responses to others, search for new information sources, and to collaborate to learn from their experiences in various classrooms. It was hypothesized that electronic dialogue journals would give students time to reflect as they constructed and presented their thoughts in dialogue with others through writing, and through receiving prompt, multiple, though not immediate, reactions to those thoughts via computer-mediated conversation. This arena of discourse was seen as therefore potentially rich for reflective discourse about teacher practice as the community of discourse became composed of many voices - students, teachers, university supervisors - collaboratively constructing meaning.

This research was designed to provide an exploratory examination of the use and nature of electronically mediated discourse by focusing primarily upon the frequency, size and type of interactive discourse. The study was conducted throughout a sixteen week semester with participants at two different placement

schools. One school (grades 1-12) was located forty seven miles from the university while the other (grades 9-12) was located only two miles away. The data set consisted of electronic messages sent from eleven student teachers (7 men, 4 women) with several content area specialties (1 physical education, 1 biology/chemistry, 3 biology, 1 business education/mathematics, 1 Spanish, 1 English, 1 mathematics, 1 social studies, 1 choral music) to the university supervisor. Additional data included field notes kept by the university supervisor and a survey of participants at the close of the semester. The university supervisor in this study was a faculty member at a midsize midwestern university whose partial role was to observe and critique middle school and secondary student teachers across several disciplines at several locations. Messages were analyzed along three dimensions to determine the extent to which electronic mail was used. First, the number of log-ons was tabulated to determine frequency of use. Second, the number of sentences in each message was counted to ascertain information about the size of messages. Finally, the messages were examined to discover emergent categories for examining the content of the discourse.

Frequency and Length of Messages:

The findings of this study are promising in understanding the viability of using electronic dialogue journal writing as a way of engaging student teachers in discourse that might foster reflectivity. The students sent a total of 294 electronic mail messages to the university supervisor during a 16-week semester. An examination of messages sent revealed that the minimum number of messages sent by any one of the student teachers was 12 and the maximum was 49. Only three student teachers sent less than the minimum (16 or one per week) required messages (10, 12, 14). The mean number of messages sent per participant was 18.4 or 1.67 per week. As student teachers were asked by the university

supervisor to send at least one message per week, it is noteworthy that, on the average, individuals exceeded the minimum requirement.

Another feature of analysis was length of messages (number of lines in the message). The average number of lines per message for the eleven participants was 19. This average changed across the semester of 16 weeks with 18 marking the average length for the first quarter of the semester, 20 for the second quarter, 25 for the third quarter and 13 for the last quarter. Throughout the semester the number of lines decreased slightly with the total average of lines in the first eight weeks being 38, as compared to 36 for the last eight weeks.

While the overall level of use is a positive indicator of student ability and willingness to use e-mail, the variation in use over the course of the semester seems somewhat surprising. One would expect that as students became more comfortable and proficient with the technology, they might be more rather than less inclined to use it. What might account for these patterns, and how did the participants perceive the use of the technology?

At the end of the semester, a survey was given to the participants to ascertain their perceptions about the use of electronic mail. Participants were given graphs of their messaging frequencies and asked to describe the peaks and valleys in their messaging activity. Some of their responses provide possible explanations for the variations in use that might give us some insight into the potentials and limitations of electronic mail for journal writing.

One obstacle was the press of other demands. Student teaching is a demanding and time consuming experience for most students. As the semester progresses, more and more responsibilities are undertaken. Just as the hectic and harried pace of teaching stifles opportunities for experienced teachers to engage in collegial discourse and reflection, the increasing demands of student teaching may marginalize the commitment to maintaining a high level of

discourse through electronic mail. That possibility can be seen in the following student comment:

> I always tried to get on e-mail once a week...but after the spring break other pressing activities took my time at school so that I was unable to get to the computer during my only free time or before or after school. (Skoshi: Chemistry)

Thus the technology itself might be less an impediment than the work demands and expectations that customarily accompany the student teaching experience.

Two other factors relate to problems of access and reliability. A student wrote, "This time I had to fight to get onto the computer because it was very busy again". In host high schools, the students got first use of limited resources which meant that student teachers had to wait until students were finished with assignments before they could use the computer to access the university mainframe. Additionally, since electronic mail is still a relatively new technology, it may suffer the kinds of limitations typical of emergent technologies. More mature technologies develop greater reliability and considerable redundancy. Schools, for example, typically have multiple computers, and video recorders so that if one is inoperable, another might be available. In the situation under study, each school had only one unit (computer, modem, telephone line) available to student teachers to access e-mail. If that unit was not operating fully, there was not a readily available system to compensate for the breakdown. One student's survey remarks reflect the impact that might have had on the frequency of use.

> The use of electronic mail was a new item for me to work with. I enjoyed learning how to use it and the times that I was at Memorial and had low frequency use, I did not have enough time to work on the computer or could not get to it. The high points of the graphed log-on activity were spots that I had more access. The low level since week eleven was due to not knowing where e-mail was located and then due to the phone breakdown. I enjoyed learning how to use it and I wish I could have used it more. Just as I was getting comfortable with it I moved schools and the phone broke. (Gordo: Physical Education)

A third major variable that is reported in students' perceptions about the variation in their use of e-mail relates to the mental or affective state of the individual. Just as student teaching is challenging in terms of time commitments

and responsibilities, it is an emotionally demanding experience. The following student survey responses indicate how those factors might have an impact on the both size and frequency of e-mail messages. Additionally, the following two responses indicate the need to talk. E-mail was there when these students wanted to talk, but when they didn't feel the need they didn't use the medium.

> Without doing a correlational analysis of my frequency & topics covered, its difficult for me to remember exactly what kind of intellectual or emotional turmoil I was going through at the time. In general, week 5, as I recall, was an intense period of self-evaluation, trying to determine what my role was in the classroom. Immediately following, in weeks 6-9, I was rather depressed because I began to realize that I may not want to be a teacher. (Tyrell: Biology)
>
> Either I was extremely high or extremely unhappy--that's when I wrote. When I felt just medium, or fairly content, I wrote nothing. (Sydney: English)
>
> High frequency log-ons are due to more time caused by less stress from the MAT program. Low frequency log-on weeks were the direct result of meeting deadlines on thesis and written comprehensive tests. High frequency could also be attributed to more messages associated with coping due to the onslot of high stress situations upcoming. (Willie: Biology)

In summary, it is worth noting that none of these comments relate to inhibitions or aversions to using the technology. The volume of messages that were sent from student teachers in this study to the university supervisor, seem to have been affected more by factors external to the learning of a new technology. Thus even as the reliability and access improves, there may not be a significant increase the use of electronic mail as long as the other conditions continue to be present.

Further understanding into participants' perceptions about the utility and effectiveness of e-mail was ascertained through another part of the survey which also gave insight into the substantive nature of the journaling process. A survey adapted from Merseth (1990) was distributed at the end of the student teaching semester (See Appendix A.). Students were asked to respond to several domains of effectiveness ranking each from least to most on a 7-point scale. These domains included uses of electronic mail such as receiving moral support,

developing a broader perspective on teaching, keeping in touch with friends, reflecting on philosophy of education, sharing teaching techniques, improving classroom management, getting help with lesson and curriculum planning and keeping connected with the university supervisor. Merseth (1990) found in his study with first year teachers using electronic networks that receiving moral support was the most predominant use of electronic mail. Students in this study responded that using electronic mail to keep in contact with the university supervisor was most important, which could be interpretted as a form of moral support. As one student in this study reported, "it made my sense of isolation less frightening." In addition, participants in this study reported that receiving moral support and reflecting on philosophy of education were the second and third most effective uses of electronic mail for them.

When student teachers were asked what suggestions they had for future use of this innovation, nearly all responded that they needed more access to the computer. Lack of computer access was noted earlier as a common complaint in the messages themselves. All participants in this study shared a common computer/modem (Apple IIe) that was also used by the high school students. It is worth noting that, in subsequent semesters, these comments from participants lead university supervisors to assist students in learning how to upload and download files, which aided in submission of assignments associated with the student teaching semester, allowed students to word process files "off-line" and spend less time on the computer attached to the modem, and decreased long distance phone charges at the school that was located at a distant site.

An examination of topics discussed in mail messages lends support to the utility of its continued use. Some of these topics (e.g., availability and location of technology, increasing demands of student teachers as the semester progressed, affect concerning the technology, student teaching, and life in

general, etc.) can be noted in the comments made above. Other topics emerged in the mail messages throughout the semester. Some of the predominant ones are discussed here.

Technological Literacy:

Students reported feelings of unfamiliarity with the technology and these feelings became a predominant topic contained in early messages. Students attempted to get help from the university supervisor about using unfamiliar computers, communications software/hardware (e.g., modems), and the mail utility on the university mainframe. The university supervisor who initiated this project felt that using electronic mail in the student teaching semester would give some students who had little experience with instructional technology needed exposure. In fact, among the eleven student teachers were two who had no experience with computers at all. Comments like "with a little help from some of my friends I was finally able to send this message to you" demonstrate this unfamiliarity. Confidence rose with continued use because messages containing statements of confusion and inquiries for technological assistance decreased as the semester progressed. In fact, students began to describe confidence in using the technology. One student who had no previous experience with computers (including word processing) and who had to master using different computers at two different schools wrote, "This is almost second hand to me now. At the beginning when I first heard we had to send messages via computer I was shell shocked, thinking that I would never be heard from again. But fortunately for my grades I did learn how to use this machine."

Supervision:

Messages focusing on aspects of supervision (e.g., assignments, observation dates) were abundant.

> This correspondence is to discuss the reading projects I have been using in my classes. I assume this will meet the requirement for SCED 464. If not let me know what else I have to do to fulfill the requirement. (Brutis: Business Education)
>
> Bad news. On Thursday I am planning all quizzes except for 6th period which will be a review day. The computer class is also going to receive a programming assignment which they will work on during class. I am sorry, but I am trying to get alot in these last few days before break and I don't have much of a choice. Let me know what you want to do. (MB: Mathematics)

It is not possible to trace the ongoing conversations between the student teachers and the supervisor in this pilot study because the data set does not include the supervisor's messages. However, supervisory field notes include commentary on the frequency and kind of responses made to students. Traditional journaling would not allow for such frequency or depth of response. Additionally, as noted before, the traditional response would be received by the student long after the original message. But a further dimension of the electronic dialogue journal over traditional journals is the frequency of short messages that can occur. "I feel that I can encourage them by sending short notes or simple messages like "Hello! How's it going?" and "I have the convenience of rescheduling observations without having to play telephone tag" (supervisor's field notes).

Reflectivity:

Reflections on practice was the largest number of messages sent to the supervisor. Students were directed to use electronic mail to send a synthesis of written self critiques from each lesson they taught during a week. Most of them composed these syntheses on-line. In this sense, electronic mail became an electronic journal, and the sharing of these entries with others (other student teachers and the supervisor) allowed these electronic journals to become electronic dialogue journals. Other students and the university supervisor could respond to the journal entries, creating written conversation, that in-turn aided the writers to collaborate in constructing a shared meaning, the making sense of their

shared experiences. The example below presents a student teacher who has identified some characteristics of students and in his own personality that conflict and seemingly cause ineffective teaching. He chose to observe a master teacher in the school whom he deems to have similar personality characteristics as a way to explore the issues that have been discussed in his reflection.

> In this reflection, I wanted to expand my horizons so as to see where my own limits of patience are with respect to activity, student behavior, and risk. Basically I wanted to observe, what I call, the risk zone. When I sat down to think about where the greatest "risk zones" are in a school, I immediately thought of two places -- Phy ed and the industrial arts classes. Both are risk areas from my perspective because of the fact that any behavior will be exhibited from students, there is an eminent danger of injury to both teacher and student, and the patience and sanity of a teacher are tested every minute. I hope you are seeing here the things I wanted to see. I wasn't so interested in learning new techniques as I was in seeing to what frustration level teaching some of the activities and discipline can be. The purpose of this I'll put simply is that I have in the past had a temper and I want to see the things that may cause one to "flare up" as we say. I decided to pick a teacher to observe in the auto shop area. I chose him because he seems to have the same temperament and tolerance level for class problems as I do. I've also had the chance to talk with him about how he deals with the classes he has and I personally like his style..." (Willie: Biology)

Moral Support:

Examination of both the mail messages and the end of the semester survey indicates that student teachers used electronic mail to a high degree to procure moral support from other student teachers sharing similar experiences in the same or in different placement schools, or from friends or faculty located at the university.

> I have come a long way. Right now I feel as though I've just climbed a mountain and reached the top only to realize that I have only reached the summit of the foothill and the mountain lies behind it waiting to be conquered. Did you ever feel like this when you were learning how to teach? (Richard: Choral Music)

Some student teachers used electronic mail like a bulletin board or newsletter to advertise and set up social gatherings (usually at a bar on Friday afternoons) to talk with each other.

> Hello gang!! Just wanted to get an idea how many people are interested in meeting this week since it starts spring break for most of us. I'm all for it!! Hope at least one other of you would like to attend, cuz drinking alone can be dangerous! (Brutis:Business Education)

This use of e-mail demonstrates how conversations can be planned to include not only the student teachers linked together using e-mail, but also significant others who were not involved in the more intimate conversation occurring in the electronic dialogue journal.

Collegiality--Supervisor-Student Relationship:

Electronic mail allows for a window through which the supervisor can observe the professional development of the student teacher. One aspect of the developing professional is a growing sense of autonomy. As student teachers mature with experience, they are weaned away from the university and develop a sense of place in the new academic community, the placement school. Additionally, as they become more established in the role of teacher, they should see their supervisors less as superiors, and more as collegeages and peers engaged in the mutual exploration of issues, problems, and challlenges.This simultaneous move toward autonomy and collegiality might be seen in this study in several ways, and raises interesting questions about the role of the technology in facilitating these moves.

First, the decreasing number of mail messages sent to the university supervisor over the course of a semester may indicate that the student teachers are less dependent on the university for problem solving and moral support. As the student teachers become confident in their thinking and problem solving and established a wider circle of colleagues with whom they could explore isssues, they may have felt less of a need for the supervisory communication from the university supervisor. At the same time, the growing sense of autonomy and independence might have been accompanied by the development of a more collaboratie and egailtarian relationship with the supervisor. In this study, the

relationship between some student teachers and the university supervisor changed from a bureacratic hierarchical relationship of power to a peer relationship of collegiality and friendship. For instance, one student teacher began the semester by addressing the university supervisor using her title, "Dr." After a few weeks she was addressed as "Sue." By the close of the semester the student teacher's messages had a greeting of merely "S-" and the salutation was frequently "love, Tyrell". Furthermore, some student teachers asked for advice from the university supervisor concerning more personal matters, some of which were not formally connected to student teaching. These included questions concerning teaching as the correct career choice, marriage and engagement, personality conflicts with cooperating teachers, and discomfort with mismatches between university preparation and real world skills. The substance of these kinds of conversations are more characterisitic of peer rather than bureaucratic relationships. Thus electronic mail might provide student teachers with informal as well as formal exchanges through which to explore all the forces that affected their entry into and experiences with the teaching profession.

Discussion:

In sum, the sheer volume of the messages generated by student teachers in this study is noteworthy in that it demonstrates that using electronic mail is a viable alternative to using traditional journals or dialogue journals. Furthermore, electronic journaling seems to have some significant advantages over traditional journaling. First, It introduces a new technology to students, and therefore expands their techological literacy and competence. Second, it places in the hands of the supervisor a new tool for managing supervisory tasks, and for monitoring and coaching student teacher growth through moral support, mutual discourse and shared reflection. Finally, the roles and relationships of supervisor

and student teacher may change because of the frequency and character of the contacts.

But does electronic mail promote reflectivity in preservice teachers? Frequency of log-ons (activity of use of the medium) and length of messages (sentence and word count) decreased throughout the semester in this study. If higher frequencies and longer messages yield increased reflectivity, then this study failed to reveal increased reflectivity as a function of using electronic mail. However, we are not convinced that numbers of words and frequency of log-ons is an effective measure of reflectivity in student teachers. Rather, it is a measure of the of use of an available tool, that if used, will be one of several influences that may foster the habit of reflection. More importantly, there is evidence in the 294 messages that the kind of thinking that student teachers participated in changed through the semester. Electronic mail, at the very least, provided a window for the supervisor to see the many and various forces that might have affected student teacher reflectivity, and therefore provide greater opporunities to encourage and extend that reflectivity. Additionally, electronic mail allows a supervisor to not only observe thinking and construction of meaning, but to participate in the creation of meaning among student teachers, independently and collectively.

Problem solving and formulation, analysis, the search for alternative solutions, the choice of a solution, level of commitment to a solution, and analysis of choice are mental activities that can be expressed in writing and shared widely through electronic mail (Merseth, 1990). Responses from others can be provided promplty as the discourse is constructed. Logically, we would argue that using electronic mail as a tool for reflection strengthens these problem solving skills because it challenges a student to condense the problem into small enough space to send it on e-mail. In so doing, the student has started working through

the problem and the readers of the message have the opportunity to assist in all stages of the problem setting and solving. As student teachers make the transition from the world of theory to the world of practice, electronic mail assists them in thinking and writing of thoughts that they might not otherwise have. It fosters probing to promote deep understanding of teaching, to engage in a written conversation about experiences associated with their making meaning of teaching. And the importance of language in this use of written conversation as it was used in this study is "that it makes knowledge and thought processes readily available to introspection and revision. If we know what we know, then we can change it...What we say and write mirrors our thought processes, and enables us to take responsibility for them." (Barnes, 1975) Teaching requires the ability to reflect on one's actions, to critique them, and to change them given different contexts. Finally, electronic mail allows for preservice teachers to gain moral support from peers going through similar experiences in similar and different contexts. Such social construction of knowledge is critical to a profession that adapts to changing student needs.

Where might this inquiry go in the future? We would argue that electronic mail used during student teaching offers a unique window on exploring and promoting the reflective process. Especially significant for the study of this reflective discourse is the record that is created that can be easily recorded, retrieved and analyzed. Not only does the writing promote introspection which is central to refection, electronic dialogue journaling provides a unique kind of record for inspection. Future development of this project will yeild an evergrowing body of reflective thought electronic recorded and easily retrievable.

Finally, the contents of the electronic mail messages discussed here and the lessons learned from this first experience have influenced and informed decisions made in relation to similar projects using electronic mail in teacher

education at the university where this study took place. When this pilot study occurred there were only eleven student teachers and one university supervisor involved. Within a year the use of electronic mail in this teacher education program has increased to include some eighty students teachers, eight university supervisors, and approximately sixty cooperating teachers working at more than ten schools at distances of fifty miles from the university.

Much has been learned to further enhance the quality and viability of this effort. Problems of hardware availability have been overcome by nurturing relationships between university faculty/personnel and school and district media specialists, administrators, and classroom teachers. Additionally, a series of small grant initiatives provided the university with a library of modems that are lent to schools where student teachers are located. Computer support staff at the university have provided workshops for student teachers at the start of each semester providing training for how to use the mail utility on the university mainframe. Inservices at local schools delivered by collaborative teams of university and school personnel have provided training for using site specific equipment, both hardware and software. At times there are some who wondered if all the effort was worth the rewards, and some of the less enthusiastic have opted to abandon the project. Many more, however, have joined the project and the majority of students have responded favorably to the benefits of using electronic mail in their student teaching semester.

Conclusions

Using electronic mail in the student teaching semester does give student teachers a vehicle for engaging in discourse that is central to the development of reflectivity. Given access, opportunity and direction, students will take advantage of this resource. In the process, they are developing a reflective habit and some students may become more motivated to reflect.

Taken together, the promising results of these initial effort convince us that electronic mail in supervision to promote reflectivity is viable and worth pursuing. Much has been learned to further enhance the project. Given the rich record that can be created, stored and retrieved through electronic mail, there is much work to be done in gaining a better understanding of how this technology can be used in ever more effective ways.

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